REMARKS

Claims 1-24 are pending in the present Application. Claims 1, 19, and 20 have been amended, leaving Claims 1-24 for consideration upon entry of the present Amendment. No new matter has been introduced by way of amendment. For example, support for the amendment to Claim 1 can be found at least on page 10, lines 24-27, of the Specification as originally filed. Support for the amendment to Claim 19 can be found in Claim 19 itself. Claim 20 has been amended to correct its dependency.

Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

Claim Rejections Under 35 U.S.C. § 102(b)

Claims 1-4, 10, 11, 14-16, and 21-22 stand rejected under 35 U.S.C. § 102(b), as allegedly anticipated by U.S. Patent No. 5,279,910 to Sasaki et al. (hereinafter "Sasaki"). Applicants respectfully traverse this rejection.

Currently amended independent Claim 1 is directed to an asymmetric supercapacitor comprising a positive electrode comprising a current collector and an active material selected from the group consisting of manganese dioxide, silver oxide, iron sulfide and mixtures thereof; a negative electrode comprising carbonaceous active material; a liquid electrolyte, wherein the liquid electrolyte is an aqueous or a non-aqueous electrolyte; and a separator plate.

Independent Claim 21 is directed to an asymmetric supercapacitor comprising a positive electrode comprising a current collector and manganese dioxide; a negative electrode comprising carbonaceous active material; an aqueous electrolyte solution; and a separator plate.

Sasaki is generally directed to a reversibly operating battery, which includes a negative electrode, a composite positive electrode, an electro-chemically active material, an electrolyte, and optionally an electron conductive material.

To anticipate a claim, a reference must disclose each and every element of the claim. *Lewmar Marine v. Varient Inc.*, 3 U.S.P.Q.2d 1766 (Fed. Cir. 1987). Sasaki fails to disclose all elements of Applicants' independent Claims 1 and 21. Specifically, there is no mention of at least the features "a liquid electrolyte, wherein the liquid electrolyte is an aqueous or a non-aqueous electrolyte" or "an aqueous electrolytic solution" as recited in independent Claims 1 and 21, respectively. The Examiner's attention in directed to the text of Sasaki, the relevant portions of which have been reproduced for convenience as shown below.

> This object of the present invention can be accomplished by a battery that comprises a negative electrode, a composite positive electrode composed of an ion-conductive high-molecular weight compound that has at least one ionic compound dissolved therein and that has a polyether structure and ion conductivity, an electrochemically active material and, optionally, an electron conductive material, and an electrolyte made of an ion-conductive high-molecular weight compound that has at least one ionic compound dissolved therein and that has a polyether structure and ion conductivity, **which battery is characterized in that said composite positive electrode and said electrolyte are formed by exposure to an active radiation such as ultraviolet rays or ionizing radiation.**
>
> (Sasaki, column 2, lines 13-28, emphasis added)

> In the present invention, **the high-molecular weight compounds of a crosslinked network structure are formed by reaction involving exposure to an active radiation such as ultraviolet rays or ionizing radiation.** Since this method is capable of completing the necessary processing within a short time at low temperature, it offers the advantage that a desired battery can be fabricated with a much higher efficiency than when the conventional thermal polymerization method is adopted.
>
> (Sasaki, column 3, lines 35-45, emphasis added)

As described in Sasaki, the electrolyte is made of an ion-conductive high-molecular weight compound that has at least one ionic compound dissolved therein. However, while the electrolyte is formed or made from a liquid (i.e., a polymer), the battery comprises an electrolyte that has been crosslinked into a solid (i.e., a networked structure). Consequently, the electrolyte of Sasaki is a solid electrolyte. This is markedly different than a battery comprising a liquid electrolyte.

In making the rejection, the Office Action states that Sasaki "clearly discloses an electrolyte layer" (Paper 23, page 2). Applicants agree that Sasaki teaches a solid, polymeric electrolyte layer. Applicants, however, disagree that the disclosure of Sasaki encompasses a liquid electrolyte claimed in the instant Application. Solid electrolytes and liquid electrolytes are distinctly different and cannot be used interchangeably. In fact, if one were to employ, for example, an aqueous electrolyte in the battery of Sasaki shown in Figure 1, any moisture (H_2O) in the aqueous electrolyte would be expected to react violently with the lithium layer 4. Thus, while Sasaki discloses electrolytes, Sasaki does not disclose liquid electrolytes as presently claimed.

For at least these reasons, Applicants respectfully request withdrawal of the rejection of independent Claims 1 and 21. Given that Claims 2-4, 10, 11, 14-16, and 22 depend from, and include all of the limitations of, their respective base claims, they too are patentable. Thus, withdrawal of the rejection of Claims 1-4, 10, 11, 14-16, and 21-22 under 35 U.S.C. § 102(b) are requested.

First Claim Rejection Under 35 U.S.C. § 103(a)

Claims 5-9 and 17-18 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Sasaki. Applicants respectfully traverse this rejection.

Sasaki is discussed above.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5

Claims 19-20, which depend from Claim 1, include, *inter alia*, the feature "a liquid electrolyte, wherein the liquid electrolyte is an aqueous or a non-aqueous electrolyte". As discussed in both the Claim Rejections Under 35 U.S.C. § 102(b) and the First Claim Rejection Under 35 U.S.C. § 103(a) above, Sasaki does not teach or suggest at least this feature.

In making the rejection, the Office Action states "Rossoll et al. teach an electrolyte being selected from the group of aqueous solutions of hydroxides of alkali metal, aqueous solutions of carbonates of alkali metals, sulfuric acid and mixtures thereof (column 5, lines 29-36)". While certain keywords mentioned by the Examiner appear in the cited passage, Applicants cannot subscribe to the Examiner's position that Rossoll teaches the electrolyte alleged by the Office Action. If this rejection is maintained, the Examiner is respectfully asked to clarify the rejection.

Rossoll fails to compensate for the deficiencies of Sasaki. As explicitly indicated in the title, Rossoll discloses only solid electrolytes. The Office Action contends that Rossoll, in column 5, lines 29-36, teaches an aqueous electrolyte as recited in Applicants' Claims 19-20. Applicants respectfully point out that the electrolyte of Rossoll, like that of Sasaki, is formed from a liquid but the cell (battery) comprises a solid electrolyte. The Examiner's attention is directed to the text of Rossoll, the relevant portion of which has been reproduced for convenience as shown below.

> The preferred preparation of the polymeric solid electrolyte would be as follows:
>
> A desired quantity of ethylene carbonate is dissolved with propylene carbonate in a small beaker. The beaker is covered and set aside until the ethylene carbonate is dissolved completely. The beaker may be heated slightly (50° C.) to expedite the process. Dried poly(ethylene oxide) is combined in a high density polyethylene bottle containing 3/4 inch diameter ceramic mixing balls with isopropyl alcohol. The solution along with a metal salt, ethylene carbonate, propylene carbonate, and a solvent can then be ball milled for a time period such as 30-45 minutes until a smooth viscous mixture is formed. The mixture can then be set aside for degasing.
>
> The polymeric electrolyte solution can then be cast onto a release paper such as a polyethylene or silicone coated release paper. The film is then allowed to dry for example about 2 hours. The film can then be transferred into a controlled temperature and humidity atmosphere (dry room) to complete the drying cycle. **The material should have a moisture content less than about 30,**

preferably less than about 20 ppm H_2O for battery use. Higher moisture levels result in a tacky film with poor mechanical properties. In addition, a latent reaction between the water and the salt (for example $LiClO_4$), the water and the lithium and/or the water and the solvent may also occur in a sealed cell if the water content is too high.

(Rossoll; column 5, line 59, - column 6, line 19; emphasis added)

From the above text, it should be abundantly clear that while the process of making the electrolyte involves liquids, the final form of the electrolyte, for use in the cell (battery) of the invention, is a solid film. Moreover, Rossoll teaches away from an aqueous electrolyte, in the highlighted portion of the text, by emphasizing the negative ramifications of having an electrolyte with a water/moisture content greater than about 30 ppm H_2O.

In view of the foregoing, Applicants contend that a *prima facie* case of obviousness has not been established because the cited references, individually or in combination, fail to teach or suggest all elements of Applicants' currently amended independent Claim 1. Further, because Rossoll teaches away from the use of an aqueous electrolyte, Rossoll provides no motivation or expectation of success to use individually or in combination with other references to obtain the Applicants invention. Accordingly, Applicants respectfully request withdrawal of the rejection to Claims 19-20.

Third Claim Rejection Under 35 U.S.C. § 103(a)

Claims 12-13 and 23-24 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Sasaki in view of U.S. Patent No. 6,162,530 to Xiao et al. (hereinafter "Xiao"). Applicants respectfully traverse this rejection.

Sasaki is discussed above.

Xiao is generally directed to a chemical synthetic method for making nanoscale materials, such as manganese dioxide.

Claims 12-13 and 23-24 depend from Claims 1 and 21, respectively. Thus, Claims 12-13 include, *inter alia*, the feature "a liquid electrolyte, wherein the liquid electrolyte is an aqueous or

non-aqueous electrolyte" and Claims 23-24 include, *inter alia*, the feature "an aqueous electrolyte solution". As discussed in the Claim Rejections Under 35 U.S.C. § 102(b), Sasaki does not disclose or even suggest at least these claim features. Furthermore, Xiao fails to compensate for the deficiencies of Sasaki because Xiao only mentions nanoscale materials as candidates for positive electrodes. Xiao is silent regarding electrolyte materials. Thus, since the cited references, individually or in combination, fail to disclose or even suggest at least one element of the present claims, a *prima facie* case of obviousness has not been established.

Accordingly, Applicants respectfully request withdrawal of the rejection of Claims 12-13 and 23-24 under 35 U.S.C. § 103(a).

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

CANTOR COLBURN LLP

By Karen A. LeCuyer

Karen A. LeCuyer
Registration No. 51,928

Date: August 3, 2004
Telephone (860) 286-2929
Facsimile (860) 286-0115
Customer No.: 23413

U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

Claims 5-9 and 17-18 depend from, and include all of the features, of Claim 1. Applicants assert that a *prima facie* case of obviousness has not been established because the cited reference fails to teach or suggest all elements of Applicants' currently amended independent Claim 1. As discussed in the Claim Rejections Under 35 U.S.C. § 102(b) above, Sasaki discloses and suggests only a battery comprising a solid (crosslinked network structure) electrolyte and, thus, does not disclose or suggest at least the feature "a liquid electrolyte, wherein the liquid electrolyte is an aqueous or a non-aqueous electrolyte".

Also as discussed in the Claim Rejections Under 35 U.S.C. § 102(b) above, the teaching of a solid, polymeric electrolyte in Sasaki does not render the use of a liquid electrolyte obvious. In fact, one of ordinary skill in the art would not be motivated, for example, to employ an aqueous electrolyte in a battery containing a lithium layer such as that described in Sasaki (column 6, lines 34-36). There is no motivation to do what the Applicants have done and no expectation of success based on the knowledge of one of ordinary skill in the art.

For at least these reasons, Applicants respectfully request withdrawal of the rejection applied to Claims 5-9 and 17-18 under 35 U.S.C. § 103(a).

Second Claim Rejection Under 35 U.S.C. § 103(a)

Claims 19-20 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Sasaki in view of U.S. Patent No. 5,362,579 to Rossoll et al. (hereinafter "Rossoll"). Applicants respectfully traverse this rejection.

Sasaki is discussed above.

Rossoll is generally directed to a solid electrolyte cell housed within a ceramic frame closed at the top and bottom surfaces with conductive terminal sheets using a solder seal.